

ROBUST, ON-LINE, VIEW-BASED APPEARANCE MODELS FOR VISUAL MOTION ANALYSIS AND VISUAL TRACKING

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ABSTRACT

A robust, adaptive, appearance model is disclosed that includes both a stable model component, learned over a long time course, and a transient component, learned over a relatively short time course (e.g., a 2-frame motion component and/or an outlier processing component). An on-line EM-algorithm is used to adapt the appearance model parameters over time. An implementation of this approach is developed for an appearance model based on the filter responses from a steerable pyramid. The appearance model is used in a motion-based tracking algorithm to provide robustness in the face of image outliers, such as those caused by occlusions. It also provides the ability to adapt to natural changes in appearance, such as those due to facial expressions, or variations in 3D pose.